Local Industrial Collaboration Project at National Institute of Technology, Ichinoseki College: Local Storytelling, Kōdan, for Inbound Tourism

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This presentation introduces a local industrial-academic collaboration project at the National Institute of Technology, Ichinoseki College, combining STEAM education with regional cultural revitalization. The project focuses on promoting inbound tourism through Kōdan, a traditional form of Japanese storytelling, by incorporating foreign language subtitles and immersive technologies such as VR. Located in the Ichinoseki-Hiraizumi area—home to UNESCO World Heritage sites like Chūson-ji Temple—this region has rich cultural resources but remains underrepresented in Japan's mainstream tourism.

Ichinoseki College is an engineering-based institution offering interdisciplinary education in mechanical, electrical, computer science, and chemical-biology. This environment enables students to apply their technical skills—such as generative AI translation, sensor-based automation, and VR imaging—to real-world challenges. For this project, students are developing a system that automatically synchronizes projected subtitles and visuals with a Kōdan performer's voice. Eventually, this will evolve into an immersive experience where the audience can wear VR headsets to explore the historical context and narrative visually as the performer tells the story.

This initiative reflects the core values of STEAM education: interdisciplinary learning, creative problem-solving, and real-world application. By treating engineering as a form of "social doctoring," the project aims to solve a regional issue—how to attract and engage foreign visitors in rural areas—through a blend of Technology (T), Engineering (E), and the Arts (A).

Moreover, the project is structured as a Project-Based Learning (PBL) experience. Students are actively involved not only in designing and programming devices but also in collaborating with professional storytellers, collecting audience feedback, and iterating on the system based on real-world usage. This sustained, student-driven engagement fosters both technical competence and a deeper understanding of community needs, laying the groundwork for socially conscious engineers.

In summary, this project demonstrates how traditional arts and advanced technology can be merged in a STEAM-based framework to foster cultural understanding, encourage inbound tourism, and develop future engineers equipped with both technical and social skills.

Keywords: *STEAM education, fusion between engineering and Japanese traditional culture, AI, VR, entrepreneur*

1. Introduction

In recent years, there has been a growing emphasis on the integration of STEAM (Science, Technology, Engineering, Arts, and Mathematics) education into real-world applications that promote interdisciplinary learning and creativity. In particular, project-based approaches that connect students with local community issues are considered effective in nurturing both problem-solving skills and cultural understanding.

This paper presents a STEAM-based educational initiative developed at the National Institute of Technology, Ichinoseki College (Ichinoseki Kosen), which aims to enhance intercultural understanding through the fusion of traditional Japanese performing arts and advanced technology. The focal point of the project is the revitalization and modernization of "Kōdan", a traditional form of Japanese storytelling, by incorporating multilingual subtitles and VR technology to create an immersive experience for inbound tourists.

Ichinoseki City and its surrounding Hiraizumi area in Iwate Prefecture are home to several culturally significant sites, including Chūson-ji Temple's Konjikidō and Mōtsū-ji Temple, which are registered as UNESCO World Heritage sites. Despite their historical value, these rural areas have remained underrepresented in Japan's tourism landscape. However, recent developments—such as Morioka's selection as the second destination in *The New York Times*' "52 Places to Go in 2023"—signal growing global interest in Iwate Prefecture.

In the post-COVID era, foreign tourists have gradually returned to Japan, with many seeking "niche" experiences in rural areas beyond the typical tourist hubs of Tokyo, Kyoto, and Osaka. These travelers are drawn to the slower pace of life, the authenticity of local culture, and opportunities for deeper cultural engagement. For such visitors, "Kōdan" offers a unique and underexplored medium through which to experience Japanese stories and traditions.

To meet this demand, students at Ichinoseki Kosen

are working in collaboration with local storyteller Chifukutei Kinme (地伏亭金目) to develop a multilingual Kōdan performance enhanced by AI-generated subtitles, projected visuals, and VR elements. This project serves not only as a platform for inbound cultural exchange but also as a hands-on learning opportunity aligned with the principles of STEAM education and entrepreneurship training (See Fig. 1).

This paper aims to demonstrate how regional revitalization and cross-cultural communication can be promoted through a technology-driven reinterpretation of traditional performing arts, highlighting the educational benefits of interdisciplinary, problem-based learning in a real-world context.

Fig. 1 A performance held on Dec 12, 2024 at National Institute of Technology.

2. Methodology

2.1 System Design and Implementation

The current system comprises a PowerPoint slideshow with manually operated transitions, synchronized to the live Kōdan performance. A handheld sensor, developed by faculty member in the Division of Mechanical and Intelligent System Engineering, is used by the performer to trigger each Slides contain subtitles, illustrations, and brief summaries of key scenes or dialogues, created in advance by the author and refined through collaboration with the performer.

Fig. 2 A handheld sensor. Bluetooth 3-Mode Connection, Include 2.4G Dongle.

2.2 Technical Setup

The system only requires a laptop, a handheld Bluetooth sensor (See Fig. 2), and a projector. Subtitles and visuals are projected behind the performer. This setup allows performances to be conducted in any facility equipped with basic projection capability, making the method highly scalable and cost-effective.

2.3 Translation and Content Creation

Initial translations are generated using generative AI and subsequently edited to reflect historical and regional nuances. These are embedded in the slides along with contextual imagery. This content is shared with the performer in advance, allowing for co-creation and minor adjustments based on performance flow.

2.4 Educational Integration and Future Vision

Moving forward, the project aims to integrate high-performance sensors, portable screens, and generative AI-enhanced translation systems. Students from various academic divisions will collaborate to improve system design, imagery generation, and promotional strategies via SNS and web development. The long-term goal is to enable performances in various locations, including outdoor festivals, tourist sites, and lunch venues for international visitors.

2.5 Performance Record and Audience Feedback

Between December 2024 and June 2025, five performances were conducted (see Table 1):

Table 1 The list of performances and their feedback. Performances on May 24 and Jube 29 have no feedback yet because this paper is submitted on May 15.

No.	Date & Venue	Audience Type	Feedback Highlights
1	Dec. 12, 2024 – Institute of Technology, Ichinoseki College(Hagishō, Ichinoseki)	74 students (4 international)	"Subtitles aided non-Japanese speakers." , "Helped with understanding names and historical references." , "Increased familiarity and enjoyment for locals."
2	Feb. 22, 2025 – Nanohana Plaza (Omachi, Ichinoseki)	32 local residents (Japanese)	"Subtitles clarified people and places.", "Slides did not distract from narration.", "Local photos enhanced relatability."
3	Mar. 22, 2025 – Hagishō Community Center (Hagishō, Ichinoseki)	11 local residents (Japanese)	"Slides supported understanding.", "Repeat attendees found improvement."
4	May 24, 2025 – Nanohana Plaza (Omachi, Ichinoseki)	Local residents	No direct feedback recorded yet.
5	Jun. 29, 2025 – Higashiyama Community Center (Higashiyama, Ichinoseki)	Local residents	No direct feedback recorded yet.

Feedback consistently highlighted the value of visual and textual aids in enhancing understanding of historical narratives. Historical narratives performed in the events above are as follows.

1. December 12, 2024 (National Institute of Technology, Ichinoseki College)
・“The Okago Kirishitan Martyrdom Story: The Legend of the Ubaiwa Stone (大籠キリシタン殉教物語 姥石の由来)”

2. February 22, 2025 (Nanohana Plaza)
・“Never to Abandon the Cause: Story of Otsuki Gentaku (遂げずばやまじ 大槻玄沢)”
・“The Legend of Otakemaru: The Origin of Demon’s Remains (大武丸伝説 鬼死骸の由来)”
・“The Pride of Ichinoseki: The Drum of Time (一関の誇り 時の太鼓)”

3. March 22, 2025 (Hagisho Community Center)
・“The Legend of Evil King of Takkoku (達谷の悪路王伝説)”
・”The Legend of Hachiman Taro Yoshiie: The Origin of the Rock Faced Daibutsu (八幡太郎義家の伝説 岩面大仏の由来)
・”The Folklore from Hagisho: Hidehira of Obanagamori (萩荘の昔話 尾花が森の秀衡)”
・”The Ako Insident: The Assault by the Forty-Seven Ronin (赤穂浪士 討ち入りの場)”

4. May 24, 2025 (Nanohana Plaza)
・”The Man Who Gained Superhuman Strength from Ghost: The Tale of Mizoguchi Hannojo (幽霊に怪力をもらった話 溝口半之丞)”
・”The Kudan’s Mother by Komatsu Sakyo (小松左京 くだんのはは)”
・”The Three Years of Feigned Madness for Revenge by Hasegawa Shin (長谷川伸 敵討冗の三年)”

5. June 29, 2025 (Higashiyama Community Center)
・”The Illustrated Scroll of Karaumedate (唐梅館絵巻)”
・”Tokkobe Torako by Miyazawa Kenji (宮沢賢治 とっこへとら子)”
・”Wooden Statue of the Amida Triad and Twenty-Five Bodhisattvas (The Twenty-Five Figures) (木造来迎阿弥陀及菩薩像 二十五さま)”

3. Results

This section presents the results obtained through the implementation of the multilingual and multimedia-assisted Kōdan performances developed in collaboration with the National Institute of Technology, Ichinoseki College. The findings are categorized into five areas: (1) attendance and performance outcomes, (2) audience responses, (3) performer adaptation, (4) student participation and learning impact, and (5) feasibility and potential scalability of the project model.

3.1 Attendance and Performance Outcomes

Since December 2024, a total of five performances have been conducted under the title “Local Kōdan corroborated with National Institute of Technology, Ichinoseki College.” These included both school-based and community-based events (see Table 1). The pilot performance on December 12, 2024, was held at the college’s Multimedia Room and attended by 74 students, including four international students. Subsequent performances in February, March, May, and June 2025 took place in various local public facilities, with audiences ranging from 11 to 32 attendees (See Fig. 3 and 4). Although the later performances focused on Japanese audiences, the multilingual subtitles and image materials were maintained for continuity and refinement of the system.

Fig. 3 The Kōdan event poster held on March 22, 2025.

Fig. 4. A picture taken at the Kōdan performance held on March 22, 2025.

3.2 Audience Response and Interpretation

Audience feedback was collected after each performance via oral comments and post-event questionnaires. The multilingual subtitles and projected visuals were consistently evaluated as helpful in

enhancing understanding, particularly by international attendees. For example, during the pilot performance, one international student commented, “Even without understanding Japanese, I could follow the story because of the subtitles.” Japanese audience members also reported that the inclusion of subtitles helped them recall or better understand historical names and place references. One attendee noted, “The subtitles helped reinforce the key terms and allowed me to concentrate on the storytelling without confusion.”

Overall, responses indicated that the multimedia format supported audience engagement across different backgrounds. Importantly, the use of images alongside regional place names fostered a stronger sense of familiarity and connection, especially for locals. These findings suggest that the integration of digital support materials does not detract from the traditional performance but rather augments the audience's comprehension and emotional involvement.

3.3 Performer Adaptation and Operational Smoothness

At the outset, the storyteller — Chifukutei Kinme — expressed concerns about incorporating sensor-based slide transitions into a live Kōdan performance. However, with simplified procedures and minimal training, he became adept at operating the system. After initial success, he independently created PowerPoint slide decks for later performances and began integrating digital elements even in performances beyond the official project events.

In addition to technical and creative skills, students gained experience in project planning, cross-cultural communication, and public engagement—skills aligned with the college's entrepreneurial education goals.

His successful adaptation demonstrated the practicality of the system: a single performer can manage content transitions via handheld sensors while maintaining narrative flow. The setup’s simplicity—requiring only a laptop, projector, and a USB-connected sensor—proved especially effective in venues with basic audiovisual infrastructure.

3.4 Student Participation and Educational Impact

Students from various academic divisions at the National Institute of Technology, Ichinoseki College were engaged in multiple phases of the project. Initially, faculty in the Division of Mechanical and Intelligent System Engineering assisted with sensor design and prototyping. The script translation and subtitle creation were led by the coordinating researcher using generative AI, then contextually edited for clarity and regional accuracy.

As the project progressed, plans were laid to integrate students more formally through entrepreneurial coursework. These student teams would be responsible for designing promotional content via websites and social media, developing new language translations with advanced AI models, and creating immersive visual experiences using VR technology. Collaborative efforts with the Division of Conputer Engineering and Informatics, as well as students from the Electrical and Electronic Engineering and Chemical-Biology divisions, opened opportunities for a fully cross-disciplinary STEAM education model.

3.5 Scalability and Feasibility

The current model is highly adaptable due to its low-cost and low-complexity design. With only a laptop, a projector-equipped venue, and a single sensor device, performances can be held in diverse indoor settings. Future funding through municipal cultural grants or startup contests may enable the purchase of mobile projection equipment and wireless sensors, making outdoor and event-based performances feasible.

This expansion would allow Kōdan storytelling to be featured during seasonal tourism events or served alongside lunch at local inns and restaurants, enhancing visitor experiences. By aligning traditional arts with modern technology, this model positions itself as a scalable cultural tourism solution. The project’s next milestone will involve co-hosting an inbound-targeted performance in collaboration with Ichinoseki City Tourism Division before the ISATE 2025 presentation.

3.6 Summary of Key Findings and Transition to Discussion

The results of this pilot project demonstrate the feasibility and effectiveness of integrating multilingual subtitles and visual aids into traditional Kōdan storytelling. Positive audience reception, the smooth adaptation by the performer, and the active involvement of students in both technical and creative roles suggest that the hybrid performance model is both scalable and educationally valuable.

4. Discussion

This study demonstrates the educational and societal potential of integrating traditional performing arts with low-barrier digital enhancements. Through the implementation of a sensor-based, bilingual subtitle system, students were able to directly contribute to the storytelling process, allowing Kōdan to become more accessible and appealing to broader audiences, including international tourists and local communities.

The overwhelmingly positive audience responses, as shown in Table 1, indicate that the use of subtitles and images enhances understanding without diminishing the essence of live oral performance. This is particularly crucial in cases where archaic vocabulary, historical context, or regional dialect might present comprehension challenges.

From an educational perspective, this initiative aligns closely with the goals of STEAM education. Students were involved not only in engineering tasks but also in cultural translation, design, and communication. By incorporating elements of entrepreneurship, including outreach, promotion, and future monetization, the project has laid the groundwork for interdisciplinary education rooted in real-world applications.

Moreover, the scalability and simplicity of the system—as illustrated in Figure 1—enable its replication in other communities or cultural contexts. The next phase

will require further collaboration with local government and tourism boards to conduct performances for inbound tourists and assess cross-cultural reception more rigorously. A notable future direction includes the implementation of VR-enhanced experiences as seen in the proposed expansion model, which would deepen immersion and engagement.

Overall, the results validate the hypothesis that traditional arts, when combined with accessible technologies, can foster intercultural understanding and simultaneously provide a fertile platform for student-centered learning across academic disciplines.

5. Conclusion

This study presented an interdisciplinary initiative that combines traditional Japanese *Kōdan* storytelling with sensor-activated subtitles and projected visuals to make regional culture more accessible, particularly for international audiences. Through performances enhanced by a simple yet effective PowerPoint-based system, the project demonstrated a practical model of integrating cultural content with engineering, AI, and language education.

Audience feedback from five public performances indicated that the subtitle-supported format was positively received by both Japanese and international viewers, improving comprehension and enhancing engagement with unfamiliar historical and cultural topics. Moreover, the technological implementation proved cost-effective and scalable, allowing a single performer to control visual aids in real time using a compact sensor.

From an educational perspective, this project provided students with opportunities to participate in a real-world application of STEAM education—merging technical development with cultural literacy, creativity, and multilingual communication. It also demonstrated the potential for students to take initiative in promoting regional heritage through digital tools.

Looking ahead, the project aims to collaborate with local governments and tourism offices to expand multilingual *Kōdan* performances for inbound travelers. The integration of more advanced generative AI translation tools, VR visualizations, and broader student involvement across divisions will continue to evolve this initiative into a sustainable, community-driven educational model.